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CORPORATE RESEARCH AND DEVELOPMENT

GENERAL ELECTRIC COMPANY ●RESEARCH AND DEVELOPMENT CENTER ● P.O. BOX 8 ● SCHENECTADY, NEW YORK 12301 ● (518) 385-2211

Bldg. K1-3B35 November 23, 1987

Dr. James L. Lake EPA South Ferry Narragansett, RI 02882

SDMS DocID 64660

Dear Jim:

As promised on the phone last Friday, I enclose a summary of the analyses that we ran last year on 24 upper Acushnet estuary sediment samples, representing 2-3" and 6-7" depths at 12 locations, 6 on each side of the estuary. Along with this I have enclosed a map showing where the samples were taken, DE-1 capillary gas chromatograms showing what well-developed Pattern H and H' dechlorination states look like, a set of GC-mass spec data for one of them, and reprints that explain the nomenclature and peak numbering system used. All but the data summary itself were included in my SETAC presentation on November 10. We also have available on each sample a DB-1 chromatogram, a 118-peak analysis and a computation of homolog levels and ortho and non-ortho chlorine numbers; but the resulting print-outs are pretty bulky, and may not be useful until we begin comparing analyses on a peak-by-peak basis.

A quick check indicates that we have leftover samples in most or all of the original containers; however, I don't believe that the sediment samples in these containers were stirred up before removal of the analytical samples, so that if there were any compositional nonhomogeneities (in the cm. range), a second sample taken from the same container might have a slightly different composition.

As I believe I mentioned, the pattern of changes in PCB congener distribution exhibited by these samples appears to have shown up in the sediments of the upper and middle Acushnet estuary, but not those of the lower (below hurricane barrier) estuary; in one of two samples from Escambia Bay near Pensacola; in those of the mid-section of the Housatonic River (southern MA and northern CT); in the mid-section of the Hudson River (Albany to Kingston), but not above it (where a different type of dechlorination is underway), or below it (where not much was happening, at least not back in the 1977-1980 period); and in whatever sediments are supplying the PCBs that get into some of the fish of the New York harbor area. At the moment, though, I don't really know why this Pattern H type of biodegradation seems to be so much further advanced in some areas than others. I am still trying to get data indicating how widespread the phenomenon may be, and hence my interest in being able to review your chromatograms of the PCBs in coastal New England sediments.

## GENERAL ELECTRIC

Dr. J.L. Lake

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Nov. 24, 1987

At any rate, look over the enclosed data on our upper Acushnet sediments, let me know which of the samples and/or chromatograms you'd like for your own investigations, and maybe we can work out some kind of a lovely mud-swap.

Best wishes for a Happy Thanksgiving.

Sincerely,

John F. Brown, Jr.

Manager, Health Research Biological Sciences Branch

JFB/j

Encl.

Table 3. PCB Levels, Distributions, and Alteration States in Subsurface Sediments of the Upper Acushnet River Estuary, New Bedford, MA

	•		-								
No.,a		Lati-	Lati- Sample		Total Orig.		Soln., Dechlor'n Status				
side		tude	tex-	Total oils,	PCBs,	1242:	loss Pat- half-losses f		s f		
wb	EC	(41 <sup>0</sup> N)	đ	<b>a</b>							
W	E	(41 N)	tured	ppm c	ppme	1254	(%)	tern	P50	P58	58-50
					•						
-	19A	40'30"	sft mud	20,000	1,637	60.30	40	11	2 5		0.6
	19B	40'30"	sft mud	28,400	1,126	68:32	40 <sup>g</sup>	H	2.5	3.1	0.6
_	18A		and	•		57:43		H	3.2	3.5	0.3
_	18B	40'30"	snd	20,700	3,285	05:95	5	H?	∿0.0	0.6	0.6
_	21A			7,040	739	06:94	6	H?	∿0.1	0.8	0.7
_	21A 21B		gr, snd	11,100	3,775	47:53	. 4	H	1.9	2.2	0.3
		40'26"	gr, snd	1,400	417	40:60	5	H	2.0	2.2	0.2
! 17A		40'21"	sft mud	46,300	3,292	80:20	9	H	0.8	2.3	1.5
17B	-	40'21"	sft mud	40,300	3,724	70:30	12 33	H	1.9	3.2	1.3
7 —	22A	40'16"	snd	5,390	765	81:19	33''	H	2.3	3.1	0.8
: -	22B	40'16"	snd	8,110	1,444	64:32	14	H	1.9	3.5	1.6
14A	-	40'16"	snd, mud	3,840	40.4	74:26	34	H	0.9	1.6	0.7
14B	~	40'16"	snd, mud	3,390	0.9	~76:24	_	H?	~0.7	~0.8	_
12A	-	40'14"	gr, snd	8,730	505	84:16	11	H'	2.1	1.6	-0.5
· 12B	~	40'14"	gr, snd	6,070	526	82:18	51	H'	3.1	2.3	-0.8
-	24A	40'12"	gr, snd	<150	0.7	~70:30	_	H?	~0.6	∿1.6	_
-	24B	40'12"	gr, snd	<150	0.3	∿65:35	_	H?	~0.9	∿1.6	-
9A	-	40'11"	gr, mud	26,700	490	94:06	8	H'	1.9	1.0	-0.9
9B	-	40'11"	gr, mud	22,900	1,135	91:09	30	н'	2.7	1.8	-0.9
5A	_	40'01"	gr, snd	12,800	304	82:18	44 <sup>h</sup>	H	1.2	1.1	-0.1
5B	-	40'01"	gr, snd	34,500	785		22	H	2.3	1.4	
2A	-	39'55"	gr, snd	1,570	150	86:14	29				-0.9
2B	-	39 ' 55 "				71:29		H	0.9	0.7	-0.2
-	26A	39'39"	gr, snd	2,050	171	67:33	22	H	2.3	1.6	-0.7
_	26B	39'39"	fiber	<440	3.2	∿54:46	-	H	∿1.3	∿1.9	-
_	205		fiber	<370	. 0.6	∿64:36	-	H?	∿0.5	∿1.3	-
Average for all sites:			13,000	1,013	61.20	18	_	1 6	1 6	0 0	
			13,000	T10T3	61:39	TO	-	1.6	1.6	0.0	

a. Depth of "A: samples 5-7.5 cm; of "B" samples 15-17.5 cm.

b. Sites located on west side of estuary, 70°55'06-09" W.

c. Sites located on east side of estuary, 70°54'51-59" W.

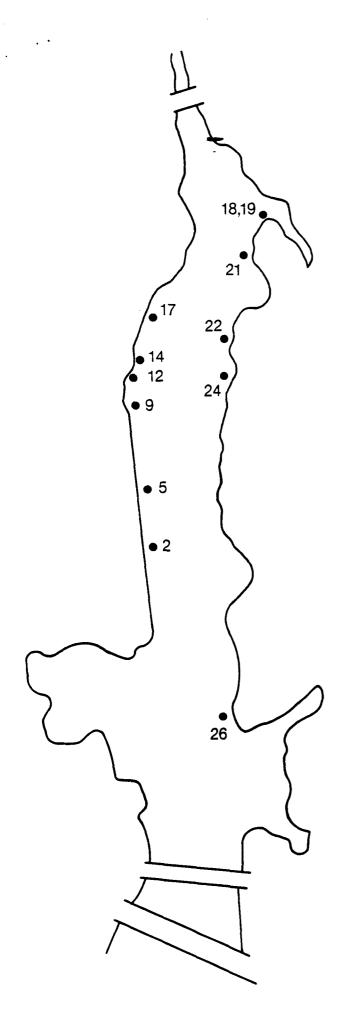
d. Key: sft, soft black mud, H<sub>2</sub>S odor; snd, sand; gr, gravel; fiber, apparently spartina root mass (marsh bed).

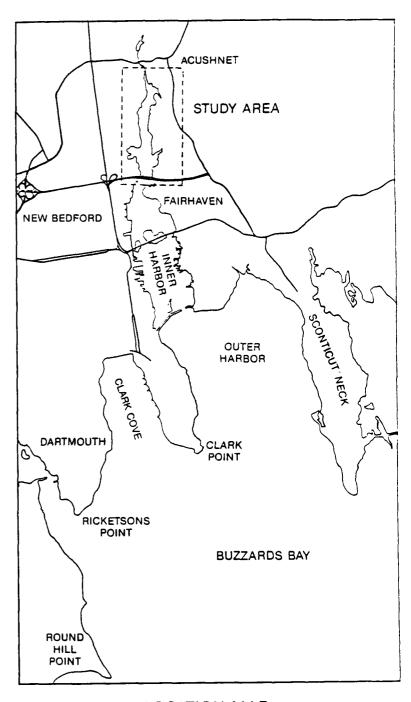
e. Parts per million of air-dried sediment weight.

f. -Log<sub>2</sub> fractional retention of peak 50 (mainly 23-34 CB from Aroclor 1242) or of peak 58 (mainly 234-25 CB from Aroclor 1254), or differences between these numbers of half-losses.

g. This calculated value probably an underestimate.

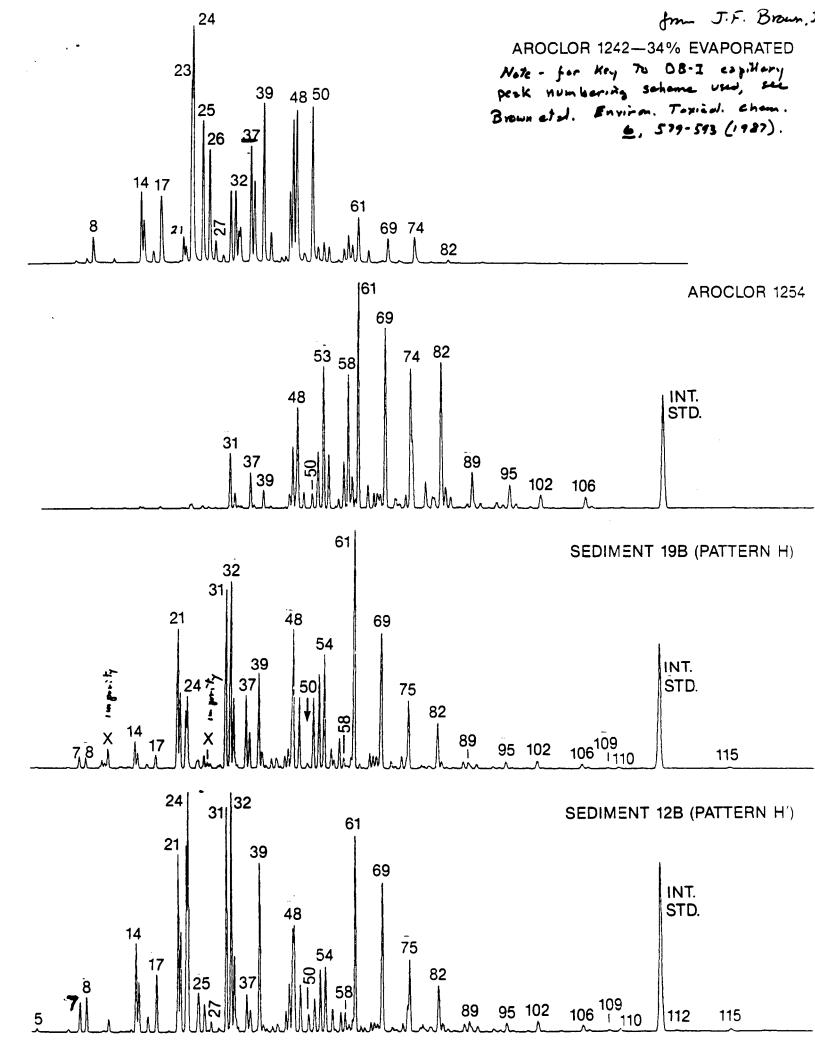
h. This calculated value probably an overestimate.





LOCATION MAP

Map of Upper Acushnet River Estuary sediment study area, showing locations of collection sites.



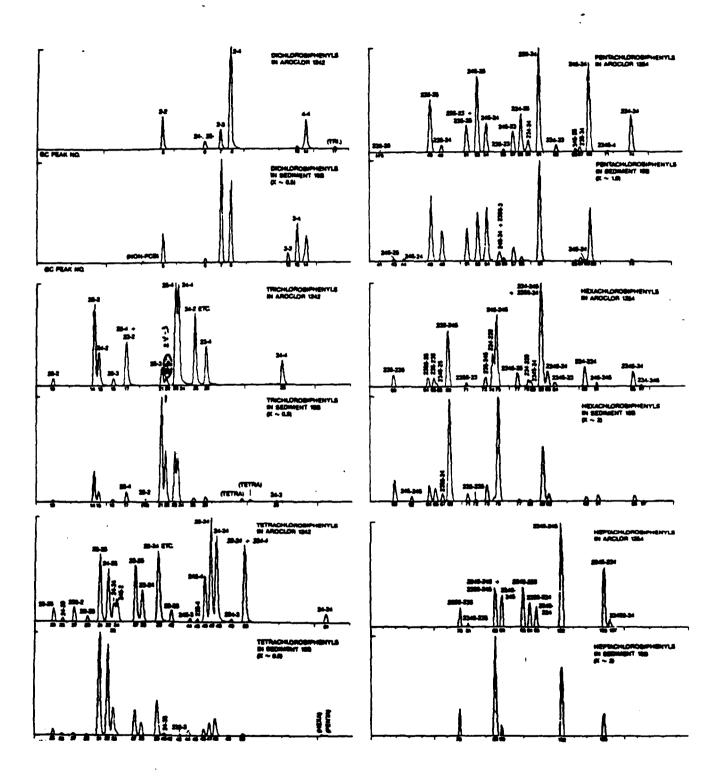


Figure 3. Gas chromatographic - mass spectrometric ion chromatograms, showing summed parent ion isotope peaks for di- through heptachlorobiphenyls in Aroclor standards and Acushnet sediment sample 198.